

REMARKS

Claims 33-71 are pending in this application. The Office Action rejects claims 1-32 under 35 U.S.C. §112; rejects claims 1-7, 11-19 and 23-32 under 35 U.S.C. §102(b); and rejects claims 8-10 and 20-22 under 35 U.S.C. §103(a). The Applicant hereby cancels claims 1-32, adds new claims 33-71, and respectfully traverses the rejections. Support for the new claims can be found, for example, in the claims as filed. No new matter is added.

I. Objections

Claims 1-32 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite. The Office Action asserts that the following terms lack antecedent basis: "the surface" in claims 1 and 11; "the state" in claim 11; "the particle" and "the object" in claim 15; the "zeta" in claim 18; and "the pH" and "the solvent" in claim 32. The Office Action also asserts that the following terms are indefinite: "a desired force" in claims 1-4, 11-14, 23-25 and 28; "predetermined" and "two of claims" in claims 5 and 18. Additionally, the Office Action asserts that claims 3 and 13 cannot be understood and that claims 15 and 28 are incomplete insofar as a "stop for removing a particle" and a recitation of subject matter in relation to "means for adding" are not included, respectively. Moreover, the Office Action asserts that claims 15 and 16 omit the essential steps of removing the particle. Applicant hereby cancels claims 1-32 and adds new claims 33-71 in order to obviate the rejections.

The cancellation of claims 1-32 has rendered the foregoing rejections moot. Newly introduced claims 33-71 do not contain such indefinite language cited by the Office Action in reference to claims 1-32.

For at least the foregoing reasons, claims 33-71 are not indefinite. Reconsideration and withdrawal of the rejections are earnestly solicited.

II. Rejections Under 35 U.S.C. §102(b)

The Office Action rejects claims 1-7, 11-19 and 23-32 under 35 U.S.C. §102(b) as anticipated by Harano et al. (U.S. 2001/0037818; hereafter "Harano"). The Office Action asserts that Harano teaches every feature of the claimed invention. The Applicant hereby respectfully traverses the rejection, cancels claims 1-32 and adds new claims 33-71.

The rejections of claims 1-7, 11-19 and 23-32 are rendered moot in view of the cancellation of claims 1-32. Claims 33-71 are not anticipated by Harano for at least the following reasons.

Each newly introduced independent claim contemplates a liquid cleaner. Instant claim 33 teaches a cleaning method for cleaning an object having a patterned structure on its surface with a liquid a cleaning agent. Likewise, independent method claims 49, 53, 54, and independent apparatus claims 60 and 68 are drawn to a cleaning agent in a liquid state. In contrast, Harano clearly and expressly teaches a sherbet-like cleaning composition consisting of snow ice crystal grains and a liquid organic chemical agent. See Harano, para. [0014]. Harano is thus not suited for many applications that involve "cleaning an object having a pattern structure on a surface," because ice crystals: 1) would seriously damage some substrates having a fine pattern, such as a photo mask; and 2) inherently require certain environmental conditions in which to function properly. To illustrate the latter point, Harano can only be operated at temperatures between the freezing point of the organic chemical agent and the freezing point of pure water. The claimed invention, however, does not contain such limitations. The claimed invention can be operated irrespective of the freezing point of pure water and utilizes only a liquid. This claimed invention thus allows for the minimization of damage to the substrate and maximized productivity due to the lack of room temperature operating constraints.

For at least the foregoing reasons Harano does not anticipate the claimed invention.

Reconsideration and withdrawal of the rejections are earnestly solicited.

III. Rejection Under 35 U.S.C. §103(a)

Claims 8-10 and 20-22 are rejected under 35 U.S.C. §103(a) as unpatentable over Harano in combination with JP 02-099175 (hereafter "JP '175"). The Office Action asserts that Harano teaches all the claimed limitations with the exception of the object having a pattern structure on the surface, the object being a photo mask, and the pattern having an undercut shape on the surface. The Office Action further asserts that JP '175 discloses a method of cleaning a substrate with a washing liquid having a high viscosity and the photo mask and the structure as claimed. It would thus allegedly have been obvious to use the process taught by Harano for cleaning the photo mask and substrate having a pattern structure on the surface of the substrate taught by JP '175 because both references are from the same technical endeavor, which is removing particles from an object by using liquid having high viscosity. Applicant respectfully traverses the rejections, cancels claims 1-32 and adds new claims 33-71.

The rejection of claims 8-10 and 20-22 is rendered moot in view of the cancellation of claims 1-32. Claims 33-71 would not have been obvious over the combination of Harano and JP '175 for at least the following reasons.

Harano, as mentioned above, utilizes a sherbet-like snow ice in a chemical liquid to clean the substrate. In Harano, snow ice having a prescribed hardness is pressed against the substrate and is moved relatively thereto, thus potentially causing damage to the substrate. Such action poses a serious problem in cases wherein the substrate has a fine pattern on its surface or is, for example, a photomask having an undercut shape. For these uses, Harano is obviously practically useless insofar as it places no importance on potential damage to the

substrate. Harano is thus aimed at simply cleaning a substrate, and not toward cleaning a substrate *having a fine pattern*, or the like.

To contrast, independent claims 33, 49, 53, 54, 60 and 68 are drawn to a cleaning agent in a *liquid state*. In the claimed invention, the force applied to an object is caused by a *liquid* cleaner with a *prescribed viscosity* being brought into contact with the object's surface. This action causes foreign matter to be removed from the surface by: 1) a force generated by movement of the viscous liquid; and/or 2) physical forces inherent in the viscous liquid that prevent the foreign matter from re-adhering to the surface. In other words, the surface and the foreign matter act repulsively due to a zeta-potential of the surface and/or a foreign matter, thus further enhancing the physical cleaning effect.

Advantageously, the claimed invention achieves the above functions without damaging the surface of the object, even in the case in which a fine pattern is formed on the object's surface. In other words, a sufficient cleaning effect, and/or a foreign matter removing effect, is exhibited by the claimed invention without using solids that could damage the surface of the object. This significant advantage and combination of features is simply not taught or suggested by the combination Harano and JP '175.

To further contrast the claimed invention with Harano's sherbet-like mixture, as mentioned above, the claimed invention can be performed at a room temperature, thus significantly increasing productivity. Moreover, the claimed invention avoids problems associated with torque that can be caused by the melting of Harano's sherbet ice during cleaning.

In addition to the foregoing, Harano describes a sherbet-like mixture having a prescribed consistency, yet there is no indication of the value of its viscosity. Because Harano teaches a mixture of a chemical liquid (e.g., isopropyl alcohol) and snow ice (i.e., pure water), it cannot be assumed that Harano inherently includes or would have rendered

obvious the claimed viscosity. In fact, if isopropyl alcohol is used, as suggested in Harano, the resultant viscosity of Harano's mixture would likely be well below the claimed 50 mPa.s.

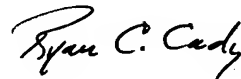
Thus, the unique combination of the claimed features solves many problems associated with the referenced teachings, including damage to the substrate and operating temperature constraints. In view of the aforementioned differences in structure and function between the claimed invention and the cited references, it is clear that Harano in combination with JP '175 does not teach or suggest the claimed features.

IV. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 33-71 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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